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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,763	02/23/2004	Shinji Fujii	249151US2S	7648
22850	7590	04/26/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ABRAHAM, FETSUM	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/782,763

Applicant(s)

FUJII, SHINJI

Examiner

Fetsum Abraham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**Final Rejection**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The relationship between said dummy via, dummy wiring layers and said via in claim 12 is not understood as presented. The structural relationship is not established in view of the contradiction that a dummy wiring was connected to a dummy via to be disconnected from said via. The problem in the claim language also makes the claim indefinite.

Claim 14 indicates "narrow width" and "wide width" to define said lower wiring layers but the expressions lack comparative reference or magnitude rendering the claims irrelevant and subject to subjective definition, thus indefinite.

Claims 12-19 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are as follows:

The relationship between said dummy via, dummy wiring layers and said via in claim 12 is not understood as presented. The structural relationship is not established in view of the contradiction that a dummy wiring was connected to a dummy via to be disconnected from said via.

Claim 14 indicates "narrow width" and "wide width" to define said lower wiring layers but the expressions lack comparative reference or magnitude rendering the claims irrelevant and subject to subjective definition.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-20, so far as understood are rejected under 35 U.S.C. 103(a) as being unpatentable over Iguchi et al (6,693,049).**

As for claims 1-4, 20, the patent discloses a multi-layered wiring in figure 2 composed of a semiconductor substrate topped by two wiring layers with cu wiring material, a lower wiring layer provided by the substrate itself (consistent with the applicant's definition of "lower wiring layer") under the interlayer layers, a via buried in the interlayer layers and connected to an upper cu wiring layer and a first damaged layer on the substrate surface (see column 2, 55-65), the damage inflicted by the etchant gas during the etching process of the via holes, a via (lower cu layer) buried in the interlayer insulation layer and connecting the upper cu layer with the damaged region on the substrate surface and on the lower wiring layer, the substrate and another via connected to a second damaged layer on the surface of the substrate but not to the upper layer in the first wiring configuration. The structure in figure 2 indeed has a damaged layer in contact with the via according to the patent and avoiding such

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damaged layers is the motivation of the prior art and its inventive essence (see the last paragraph of claim 2).

Although the prior art may have not used the term "dummy" to define any one of his vias, the so called dummy in the present invention is structurally similar to that in the prior art for one skilled in the art to safely correlate the structures and interpret any one of the multiwiring layers in the prior art as dummy from broader point of definition.

As for claims 2-4, the claimed structure is part of the prior art with the exception of defining one set of the multilayered wiring as "dummy".

As for claim 5, the damaged region on the substrate are formed during the formation of the via on the substrate which exposes it to the etchant gas.

As for claim 6, the substrate defined by applicant as "lower wiring layer" is wider than the vias.

As for claims 7, 11-13, so far as understood, the claimed elements are nothing beyond multiples of the same multilayered wiring structures, which can be duplicated on the substrate as is commonly done in art depending on the anticipated number of them for a specific application.

As for claim 8, the claimed distance between adjacent elements in any such structures is always pre-designed.

As for claim 9, the damaged areas indeed surround the wiring vias in all directions since they naturally expand to their maximum limitation on the substrate when looked from three-dimensional point of view.

As for claim 10, the general structure of the second lower wiring layer is independent of the first upper wiring layer adjacent its position.

As for claims 14-19, so far as understood, narrow width as claimed is subjective definition. In the absence of comparative dimension for the expression, any dimension including those in the prior art read on it well. Besides, it is known for the etchant gas on the exposed sections of the substrate to expand laterally and damaged the immediate vicinity of the substrate called by applicant as the lower wiring layer where the via is formed on. The unavoidable processing condition should prevent the uniformity in dimension so far as the overall structure associated by with the via.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to PN: 6,846,227.

Applicant's amendment necessitated the new ground(s) of rejection presented in this office action. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fetsum Abraham whose telephone number is: 571-272-1911. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915.

  
Fetsum Abraham  
4/7/05